

**AMENDMENTS TO THE CLAIMS**

**1. (currently amended).** A submount comprising:

a submount substrate, said submount substrate having a surface roughness  $R_a$  that is less than or equal to 0.1 micron and a flatness that is less than or equal to 5 microns; and

a solder layer comprising at least a first metal and a second metal in a specific mass ratio formed on a primary surface of said submount substrate, said solder layer having a thickness that is at least 0.1 micron and is no more than 10 microns, and having a

~~wherein the relative density of said solder layer before melting~~ that is at least ~~80%~~ 50% and no more than 99.9% of the theoretical density of said solder layer.

**2. (previously presented):** A submount as described in claim 1 wherein said solder layer contains at least one of the following: gold-tin alloy, silver-tin alloy, and lead-tin alloy.

**3. (previously presented):** A submount as described in claim 1 wherein said solder layer before melting is formed on said submount substrate and includes a first layer containing silver and a second layer, formed on said first layer, containing tin.

**4. (original):** A submount as described in claim 1 further comprising an electrode layer formed between said submount substrate and said solder layer.

**5 (original):** A submount as described in claim 4 wherein said electrode layer contains gold.

**6. (previously presented):** A submount as described in claim 4 further comprising a solder

adhesion layer formed between said solder layer and said electrode layer;

wherein said solder adhesion layer contains: a noble metal layer disposed on said solder layer side and containing at least one of the following: gold, platinum, palladium, and alloys thereof; and a transition element layer disposed on said electrode layer side and containing at least one of the following: titanium; vanadium; chromium; zirconium; niobium; and alloys thereof.

**7. (previously presented):** A submount as described in claim 1 further comprising an adhesion layer and a diffusion barrier layer formed between said submount substrate and said solder layer;

wherein

said adhesion layer is formed to contact said primary surface of said submount substrate;

and

said diffusion barrier layer is formed on said adhesion layer.

**8. (original):** A submount as described in claim 7 wherein said adhesion layer contains titanium and said diffusion barrier layer contains platinum.

**9. (previously presented):** A submount as described in claim 1 wherein said submount substrate contains sintered aluminum nitride or sintered alumina.

**10. (previously presented):** A semiconductor device comprising:

a submount as described in claim 1; and

a semiconductor light-emitting element mounted on said solder layer of said submount.

**11. (previously presented)** The submount as described in claim 1, wherein said first metal is gold and said gold is either at least 65% by mass and no more than 85% by mass, or at least 5% by mass and no more than 20% by mass of said solder layer.

**12. (previously presented)** The submount as described in claim 1, wherein said first metal is silver and said silver is no more than 72% by mass of said solder layer.

**13. (currently amended)** A submount comprising:

a submount substrate; and

a solder layer comprising at least a first metal and a second metal in a specific mass ratio formed on a primary surface of said submount substrate, wherein said solder layer is formed on the primary surface of said submount substrate by a film-formation process having a film-formation rate of between 1.8 nm/sec and 10 nm/sec, such that

~~wherein said solder layer is formed using a solder film formation rate of at least 1.3 nm/sec so that~~ the relative density of said solder layer before melting is at least 80% and no more than 99.9% 50% of the theoretical density of said solder layer.